BRIDGEABLE POWER AMPLIFIER

AMPLIFICATEUR DE PUISSANCE PONTABLE

GM-H22

OWNER'S MANUAL
MODE D'EMPLOI

Thank you for purchasing this PIONEER product. It is designed to give you many years of enjoyment.

PIONEER SUGGESTS USING A PROFESSIONAL INSTALLER DUE TO THE COMPLEXITY OF THIS PRODUCT

Please read all instructions and **WARNINGS** in this manual before attempting operation. Should you have any questions contact your nearest Pioneer authorized dealer or installation specialist.

Important

The serial number of this amplifier is written on the bottom of this unit. For your own security and convenience, write it down on the enclosed warranty card. Keep the card handy for future reference.

Nous vous remercions sincèrement pour l'achat de ce produit PIONEER. Cet équipement a été conçu pour vous donner une entière satisfaction durant de longues années.

PIONEER RECOMMANDE D'UTILISER UN TECHNICIEN DE MONTAGE PROFESSIONNEL EN RAISON DE LA COMPLEXITE DE CE PRODUIT.

Il est également recommandé de lire toutes les instructions, et tous les **AVERTISSEMENTS** de ce manuel avant d'opérer cet équipement. Si vous avez des questions, contactez votre fournisseur Pioneer autorisé le plus proche, ou votre spécialiste pour l'installation.

SPARE PARTS MASTER

PIONEER®

The Art of Entertainment

Dear Customer:

Selecting fine audio equipment such as the unit you've just purchased is only the start of your musical enjoyment. Now it's time to consider how you can maximize the fun and excitement your equipment offers. This manufacturer and the Electronic Industries Association's Consumer Electronics Group want you to get the most out of your equipment by playing it at a safe level. One that lets the sound come through loud and clear without annoying blaring or distortion—and, most importantly, without affecting your sensitive hearing.

Sound can be deceiving. Over time your hearing "comfort level" adapts to higher volumes of sound. So what sounds "normal" can actually be loud and harmful to your hearing. Guard against this by setting your equipment at a safe level BEFORE your hearing adapts.

To establish a safe level:

- Start your volume control at a low setting.
- Slowly increase the sound until you can hear it comfortably and clearly, and without distortion.

Once you have established a comfortable sound level:

- Set the dial and leave it there.

Taking a minute to do this now will help to prevent hearing damage or loss in the future. After all, we want you listening for a lifetime.

We Want You Listening For A Lifetime

Used wisely, your new sound equipment will provide a lifetime of fun and enjoyment. Since hearing damage from loud noise is often undetectable until it is too late, this manufacturer and the Electronic Industries Association's Consumer Electronics Group recommend you avoid prolonged exposure to excessive noise. This list of sound levels is included for your protection.

Decible Level	Example
30	Quiet library, soft whispers
40	Living room, refrigerator, bedroom away from traffic
50	Light traffic, normal conversation, quiet office
60	Air conditioner at 20 feet, sewing machine
70	Vacuum cleaner, hair dryer, noisy restaurant
80	Average city traffic, garbage disposals, alarm clock at two feet.

THE FOLLOWING NOISES CAN BE DANGEROUS UNDER CONSTANT EXPOSURE

90	Subway, motorcycle, truck traffic, lawn mower
100	Garbage truck, chain saw, pneumatic drill
120	Rock band concert in front of speakers, thunderclap
140	Gunshot blast, jet plane
180	Rocket launching pad

Information courtesy of the Deafness Research Foundation.

⚠ WARNING

TO PREVENT ELECTRICAL SHOCK, FIRE AND OTHER INJURY, PLEASE NOTE THE FOLLOWING AREAS.

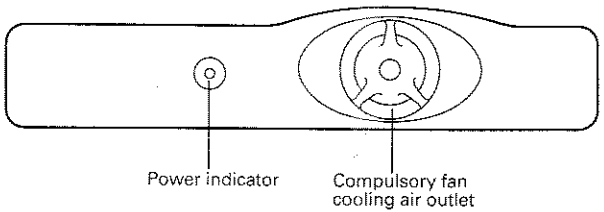
- Before starting the installation make sure to disconnect the vehicle's negative (–) battery power cable. This will prevent possible electrical shock.
- Replace the battery lead fuse with one of the same size and rating (10-amp fuse).This will prevent damage to the amplifier and may prevent a possible fire.
- The speakers must never be grounded to the car chassis or body of vehicle. To do so will cause severe noise problems and can cause damage to the amplifier. If the speaker leads are grounded it will cause the amplifier's short circuit protection to be activated, thereby turning off the audio.
- Amplifiers installed in the passenger compartment should be securely anchored in place.
- Before drilling any mounting holes check behind where you want to drill the holes to make sure you do not drill into anything such as the gas lines, brake lines or electrical wiring.
- Do not install the amplifier anywhere it can get wet.
- Install the amplifier in a location with good ventilation. Do not place anything on top of amplifier to prevent airflow through the unit.
- While driving keep your listening volume at a level which does not mask important outside traffic noises, such as emergency vehicles, etc.
- High sound levels may cause permanent hearing loss.
- This amplifier draws a lot of current. Only use it while the engine is running; otherwise, your battery may go flat.

Controls and their Use

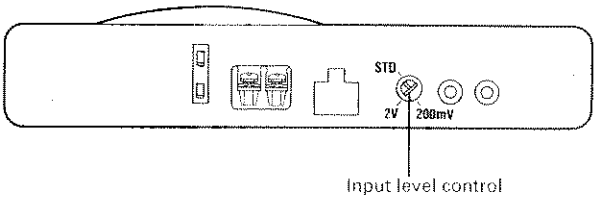
Power Indicator
The power indicator lights when the power is switched on.

Compulsory fan cooling system
This is a high-power amplifier, so it produces a lot of heat. To keep it cool, it has fan cooling.

- When the volume increases, the compulsory cooling fan of this power amplifier works automatically and colls inside of this amplifier.
- Install the amplifier so there is enough space front and back to allow the fan cooling to work properly. If the front or back side is covered, the amplifier may malfunction or fail.



Input Level Adjustment
If the sound is too low even when the volume of the car stereo used along with this power amplifier is turned up, turn input level control on the back of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the input level control counterclockwise.



Connecting the Units

Connect the components as shown in the diagram on page 11.

WARNINGS

- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- Amplifier ground connections (Black) should only be made to the vehicle's metal body or chassis for safety reasons. The ground circuit carries the same current as the power lead from the vehicle's battery. To get good contact when grounding, sand the metal surface to expose the bare metal. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems.
- Connect the supplied battery power lead (red) to the power terminal that supplies 10 to 20A, coming via the car's fuse box, regardless of whether the ignition is on or off.

- It is recommended that the speakers connected to the amplifier have the minimum ratings shown below. If a speaker has a rating below what is recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

Mode	Speaker ratings	
Two-channel	Maximum	50 W
	Nominal	25 W
One-channel	Maximum	140 W
	Nominal	70 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the amplifier power leads away from the signal cords (RCA cords) and speaker leads. Also, keep the power leads away from any antenna cords.
- Before finalizing the installation, turn everything on, and make sure everything works correctly and listen for noise in the system.
- For detailed information on connections between different units and the amplifier, use the instruction manuals for the units. It is important to follow their recommendations precisely.

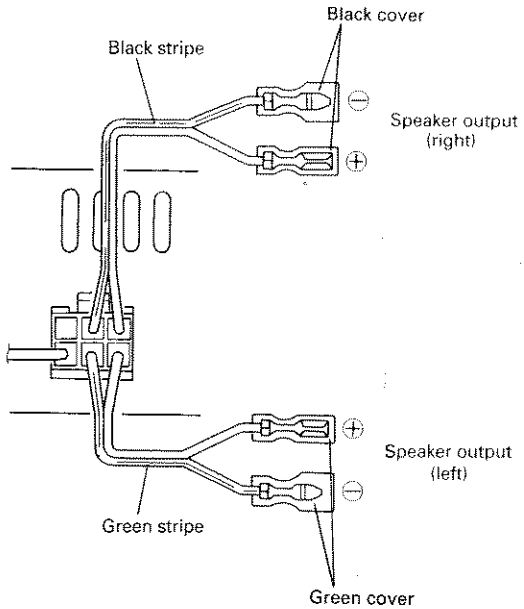
Connecting the leads (supplied)

Connecting the speaker leads

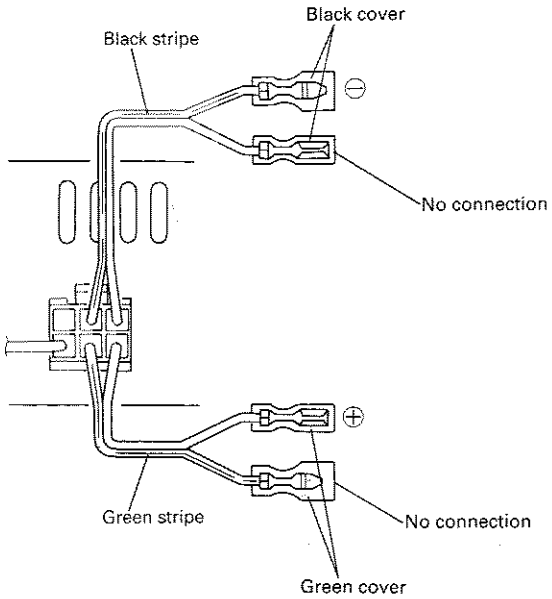
The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker leads to suit the mode , see the connection diagram for each channel. Be careful with the (+ and -), and with which channel is which (left [L] and right [R]).

- If the amplifier is used in three-channel mode, inductors and capacitors are needed. For more information, see "Three-channel mode (stereo + mono)".

Two-channel mode (stereo)



One-channel mode (mono)

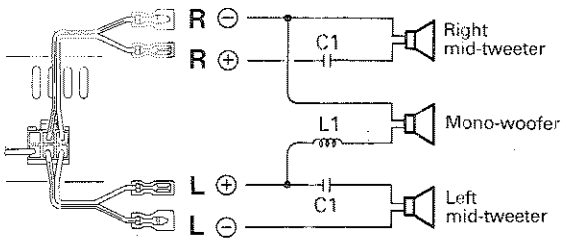


The following examples (1 and 2) require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.

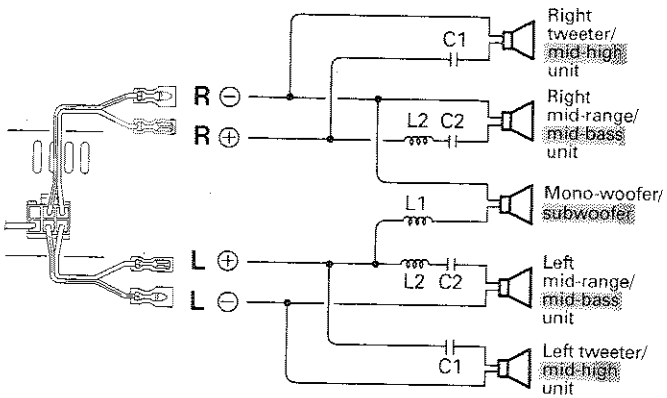
Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. Some typical examples are given below.

Example 1 Three-channel, two-way system



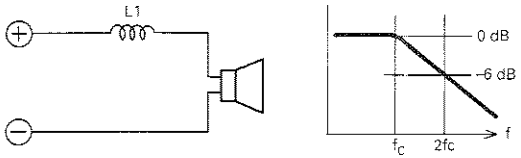
Example 2 Three-channel, three-way system



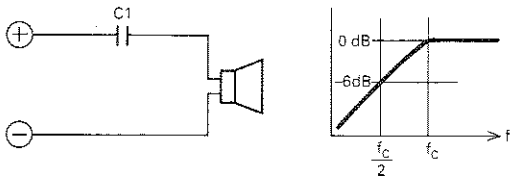
- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter.
  Refer to the Component Guide table on page 9.
- In the three-channel mode Pioneer recommends that an inductor (L) be used on the woofer/subwoofer, and that a capacitor (C) be used on the midrange/tweeter. Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.
- When the inductors and capacitors are connected to the speaker leads, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.

Setting the filter constant

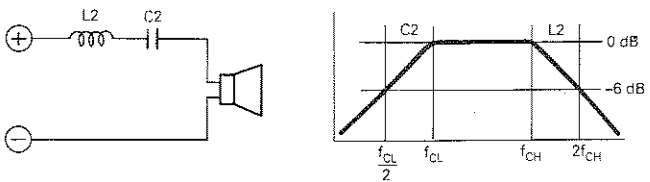
① **Low-pass filter (for subwoofer/woofer): 6 dB/octave**



② **High-pass filter (for mid-tweeter/mid-high-tweeter): 6 dB/octave**



③ **Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave**



Component Guide

Speaker load impedance	2Ω		4Ω		8Ω	
fc (Hz)	L (mH)	C (μF)	L (mH)	C (μF)	L (mH)	C (μF)
50	6.4	1600	12.7	800	25.5	400
80	4.0	1000	8.0	500	16	250
125	2.5	640	5.1	300	10	160
200	1.6	400	3.2	200	6.4	100
320	1.0	250	2.0	125	4	62
500	0.64	160	1.3	80	2.6	40
800	0.4	100	0.8	50	1.6	25
1250	0.25	64	0.5	30	1.0	16
2000	0.16	40	0.3	20	0.64	10
3200	0.1	25	0.2	12.5	0.4	6.2
5000	0.06	16	0.13	8	0.26	4
8000	0.04	10	0.08	5	0.16	2.5
10000	0.03	8	0.06	4	0.13	2

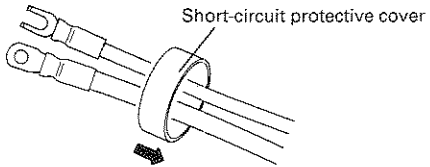
- A multi-channel system can be set up using a combination of filters ①, ②, and ③. The inductance (L) and capacitance (C) will determine the frequency (Hz) that the speaker will reproduce. Refer to the chart on the above to determine the components required.

WARNING

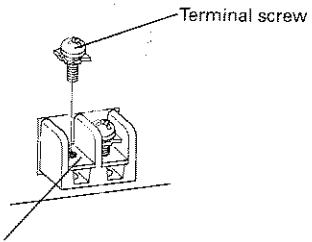
- Use the capacitors specified. Non-polarized capacitors rated at over ±25 V should be used for C1 and C2 in the diagram. Because of the voltage output of the amplifier it is very important to use non-polarized capacitors rated at or over 25 V. This will prevent a safety hazard.

Connection of the battery power and ground leads

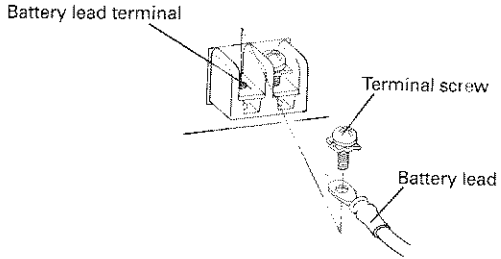
1. Pass the battery power and ground leads through the short-circuit protective cover.
   - This protective cover *must* be used to prevent short-circuits.



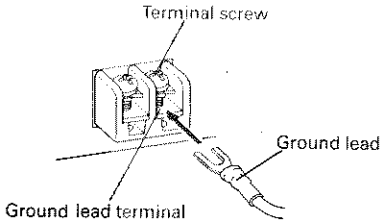
2. Loosen the screws of the terminals on the front of the amplifier.
   - Remove the screw from the battery power terminal.



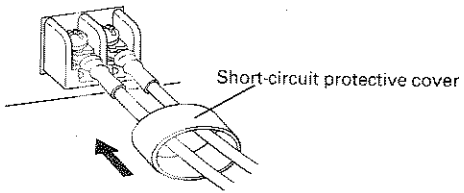
3. Connect the battery lead to the battery lead terminal, reinserting and tightening the screw.

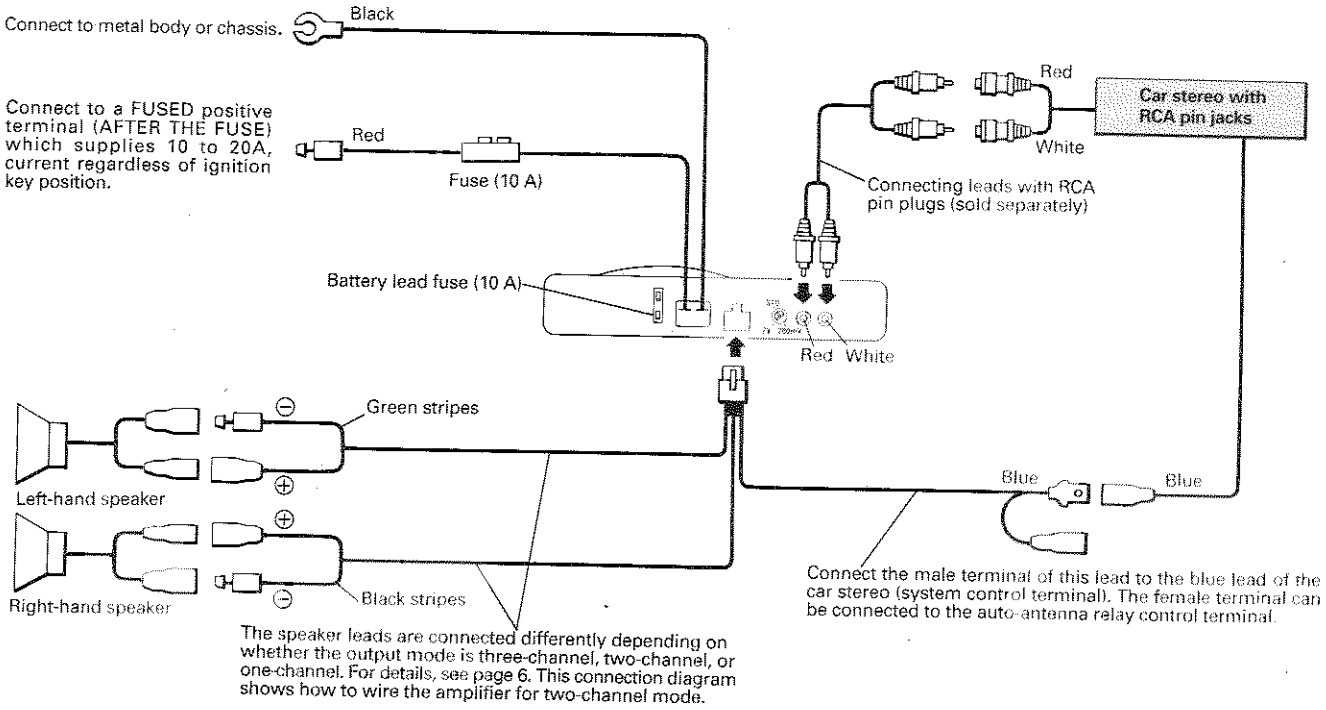


4. Connect the ground lead to the ground lead terminal, tightening the screw.



5. Cover the terminals with a short-circuit protective cover.




Connect to metal body or chassis.
Black
Connect to a FUSED positive terminal (AFTER THE FUSE) which supplies 10 to 20A, current regardless of ignition key position.
Red
Fuse (10 A)
Red
White
Car stereo with RCA pin jacks
Connecting leads with RCA pin plugs (sold separately)
Battery lead fuse (10 A)
Red White
Green stripes
Left-hand speaker
Right-hand speaker
Black stripes
Blue
Blue
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
The speaker leads are connected differently depending on whether the output mode is three-channel, two-channel, or one-channel. For details, see page 6. This connection diagram shows how to wire the amplifier for two-channel mode.

FINAL STEP OF THE INSTALLATION

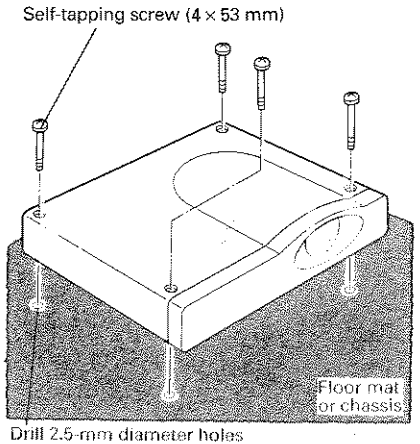
Finish the installation by reconnecting the vehicle's negative (–) battery lead.

Installation

- Install the amplifier where it will not obstruct driving and will not be a danger to passengers in an emergency stop (see page 13 for diagram of possible mounting locations).
- If the amplifier is installed in the passenger compartment, anchor it securely so it does not break free while the car is moving, and cause injury or an accident.
- If the amplifier is installed under a front seat, make sure it does not obstruct seat movement. Route all leads and cords carefully around the sliding mechanism so they do not get caught or pinched in the mechanism and cause a short circuit.
- Do not obstruct the air flow through the front and back of the amplifier—for instance, by putting the amplifier under the carpet or a floor mat—otherwise, the amplifier will overheat and possibly fail.
- Do not install the amplifier near the heater outlet, otherwise it may overheat and possibly fail.
- Do not install the amplifier anywhere it can get wet, otherwise it may give an electric shock if touched.
- To prevent a short-circuit, disconnect the negative battery lead before beginning the installation. After installation has been completed and checked, reinstall any components that were moved or removed, then reconnect the lead to the negative battery terminal.
- Before drilling any mounting holes always check behind where you want to drill the holes. Do not drill into the gas line, brake line, electrical wiring or other important parts.
- Use only the parts supplied. These parts are designed to help you securely install the amplifier.
- If mounting the amplifier vertically, buy some 4-mm-diameter screws and nuts, and use them to secure the amplifier firmly, so that it cannot be dislodged by the vibration of the car.

Example of installation on the floor mat or on the chassis

1. Place the amplifier where it is to be installed. Insert the supplied self-tapping screws (4 × 53mm) into the screw holes. Push on the screws with a screwdriver so they make marks where the installation holes are to go.
2. Drill 3-mm diameter holes at the point marked, and install the amplifier, either on the carpet or directly on the chassis.



Care and Maintenance

WARNING

- When replacing the battery lead fuse, use one that is identical in size and rating (10-amp fuse). This will prevent damage to the amplifier. Also, this may prevent a possible fire.

- Do not use the amplifier at high volumes for a long periods of time with the engine off or idling. At high volumes this amplifier can draw enough current from the battery which may make it difficult to start your engine.
- If a malfunction occurs, the protection circuitry will operate instantaneously by turning off the amplifier. If this happens, disconnect the power to the car stereo system. Check the wiring for the possible cause of problem. Fix the problem before reconnecting power to the car stereo system.
- For most cars, the existing battery and charging system will handle a single amplifier. Although this amplifier requires a maximum current consumption of 10 amp. Please be cautious about using this amplifier in a vehicle with a weak battery or a weak charging system. Consult your Pioneer dealer and or installation specialist for further details.

In Case of Problems

If the amplifier will not operate properly, contact your Pioneer dealer and or nearest authorized Pioneer service station.

Specifications

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	6.2 A (at continuous power, 4Ω)
Average current drawn*	2 A (4Ω for two channels) 4.2 A (4Ω for one channel)
Fuse	10A
Dimensions	230 (W) × 40 (H) × 180 (D) mm [9 (W) × 1 - 5/8 (H) × 7 - 1/8 (D) in.]
Weight	1.6 kg (3.5 lbs.)(Leads for wiring not included)
Maximum power output	50 W × 2/140 W × 1 (EIAJ)
Continuous power output	25 W × 2/70 W × 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD) 35 W × 2 (at 2Ω, 20 - 20,000 Hz, 0.8% THD)
Load impedance	4Ω (2 - 8Ω allowable)
Frequency response	10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	100 dB (IHF - A network)
Distortion	0.003% (at 10 W, 1 kHz)
Separation	60 dB (1 kHz)
Input level	0.2 - 2 V /8 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

***Average current drawn**

The average current drawn is nearly the maximum current drawn by this unit when an audio signal is input. Use this value when working out total current drawn by multiple power amplifiers.

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